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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/528,125	11/21/2005	Jorg Heller	STERN21.003APC	8936

20995 7590 04/14/2008

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EXAMINER	
WONG, EDNA	

ART UNIT	PAPER NUMBER
1795	

NOTIFICATION DATE	DELIVERY MODE
04/14/2008	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No.	Applicant(s)	
	10/528,125	HELLER ET AL.	
	Examiner	Art Unit	
	EDNA WONG	1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *28 March 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-18* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-18* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on March 28, 2008 has been entered.

This is in response to the Amendment After Final dated February 28, 2008. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office Action.

Response to Arguments

Claim Rejections - 35 USC § 112

Claims **1-18** have been rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

The rejection of claims 1-18 under 35 U.S.C. 112, first paragraph, has been withdrawn in view of Applicants' amendment.

Allowable Subject Matter

The indicated allowability of claims **1-18** is withdrawn in view of the new grounds of rejection.

Claim Objections

Claim **1** is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form.

Claim 1

lines 13-14, it is suggested that the limitation of "R^1, R^2, R^3, R^4 are the same or different, R^1, R^2, R^3, R^4 being a C_1-C_4 alkyl group" be amended to -- R^1, R^2, R^3, R^4 are the same or different C_1-C_4 alkyl groups --.

Claim Rejections - 35 USC § 112

Claims **1-18** are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1

lines 14-15, it appears that "a halogen-free aprotic solvent" is the same as the halogen-free aprotic solvent recited in claim 1, line 5. However, it is unclear if it is. If it is,

then it is suggested that the word "a" be amended to the word -- the --.

Claim 5

lines 2-3, "the electro***lyte*** bath" lacks antecedent basis.

Claim 9

lines 2-3, "the electro***lyte*** bath" lacks antecedent basis.

Claim 11

lines 1-2, "the pretreatment is performed" lacks antecedent basis. The recitation of "pretreatment" in claim 1, line 4, characterizes the electrolyte and is not a method step. The method step is "immersing", not pretreating.

Claim 12

lines 1-2, "the pretreatment is performed" lacks antecedent basis. The recitation of "pretreatment" in claim 1, line 4, characterizes the electrolyte and is not a method step. The method step is "immersing", not pretreating.

Claim 17

lines 1-2, "the pretreatment is performed" lacks antecedent basis. The recitation of "pretreatment" in claim 1, line 4, characterizes the electrolyte and is not a method

step. The method step is "immersing", not pretreating.

Claim 18

lines 1-2, "the pretreatment is performed" lacks antecedent basis. The recitation of "pretreatment" in claim 1, line 4, characterizes the electrolyte and is not a method step. The method step is "immersing", not pretreating.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims **1-18** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Dotzer et al.** (US Patent No. 3,969,195) in combination with **DE 198 55 666** ('666) and **Lehmkuhl et al.** (US Patent No. 6,652,730 B1).

Lehmkuhl is an English equivalent of DE '666.

Dotzer teaches a method for electrolytic coating of a material with aluminum, magnesium or alloys of aluminum and magnesium, said method comprising:

(a) immersing an aluminum/magnesium alloy or zinc/magnesium alloy material (= articles made of ferrous, non-ferrous and light metals and alloys thereof, e.g., *aluminum*, beryllium, *magnesium*, molybdenum, steel, tantalum, titanium, tungsten, vanadium and

zinc and *their alloys*) [abstract] in ***an electrolyte bath*** consisting of:

(i) ***an electrolyte*** for pretreatment (= a 1:1 mixture of $Na[Al(C_2H_5)_4]$ and $K[Al(C_2H_5)_4]$); and

(ii) a halogen-free, aprotic solvent (= the article wet with toluene),

wherein said material is electrically connected as an anode therein, and anodically charging the material (= is anodically stressed for a short period in order to loosen and remove surface film and scale) [col. 7, lines 18-25]; and

(b) reversing polarity of the material, thereby performing the electrolytic coating in an electrolyte (= $MX_nAlR'R''R$) [col. 7, lines 55 to col. 8, line 6] immediately thereafter (= subsequently, the article is immersed, wet with pretreatment electrolyte, directly into the aluminizing bath, under inert gas (N_2), and the cathodic aluminizing electroplating process is conducted, accompanied by electrode agitation) [col. 7, lines 25-30],

the electrolytic bath consisting of ***organoaluminum compounds as the electrolyte*** (= a 1:1 mixture of $Na[Al(C_2H_5)_4]$ and $K[Al(C_2H_5)_4]$), and a halogen-free, aprotic solvent being used as solvent for the electrolyte (= the article wet with toluene) [col. 7, lines 18-25].

The electrolytic coating is performed at temperatures of from 80 to 105°C (= 100°C, col. 13, Example 3; and 80°C, col. 14, Example 4) .

The electrolytic coating is performed at temperatures of from 91 to 100°C (= 100°C) [col. 13, Example 3].

The pretreatment is performed at an anodic load of the material with a current

density of from 0.2 to 2 A/dm^2 (= at a current density of 18 mA/cm^2 = 1.8 A/dm^2) [col. 14, lines 7-8].

The pretreatment is performed for a period of from 1 to 20 minutes (= anodically pre-treated for 15 min.) [col. 14, line 6-7].

The pretreatment is performed for a period of from 5 to 15 minutes (= anodically pre-treated for 15 min.) [col. 14, line 6-7].

The method of Dotzer differs from the instant invention because Dotzer does not disclose the following:

a. Wherein performing the electrolytic coating is in ***the same electrolyte***, as recited in claim 1.

b. Wherein the electrolytic bath consisting of organoaluminum compounds of general formulas (I) and (II):

$$M[(R^1)_3Al\text{-}(H\text{-}Al(R^2)_2)_n\text{-}R^3] \qquad (I)$$

$$Al(R^4)_3 \qquad (II)$$

as the electrolyte, wherein n is equal to 0 or 1, M is sodium or potassium, and R^1, R^2, R^3, R^4 are the same or different, R^1, R^2, R^3, R^4 being a C_1-C_4 alkyl group, as recited in claim 1.

Dotzer teaches that all organoaluminum electroplating electrolytes correspond to the general formula: $\underline{MX_nAlR'R''R}$ (col. 7, line 55 to col. 8, line 6).

Like Dotzer, Lehmkuhl teaches aluminizing aluminum-magnesium alloys.

Lehmkuhl teaches that compounds of the general type MX_2AlR_3, which are employed either as molten salts or in the form of their solutions in liquid aromatic hydrocarbons, and of $M[R_3Al\text{-}X\text{-}AlR_3]$ have been used for the electrolytic deposition of aluminum (col. 1, lines 14-28; and col. 2, lines 4-12).

Lehmkuhl teaches that the use of organoaluminum electrolytes which are characterized by containing:

(i) either (in the case of *electrolyte type I*) alkali tetraalkylaluminate $M[AlR_4]$ or (in the case of *electrolyte type II*) alkali hexaalkylhydrido-dialuminate;

(ii) $M[AlR_4]$; and

(iii) trialkylaluminum AlR_3,

wherein R = CH_3, C_2H_5, C_3H_7 or n- or iso-C_4H_9; and M = Li, Na, K, Rb, Cs (col. 2, lines 50-59) provides halide-free organoaluminum electrolytes which combine in themselves optimally the properties required for a technical application for the deposition of aluminum and aluminum-magnesium alloys, such as solubility of both aluminum and, in the case of alloy layers, magnesium anodes by electrolysis, as high as possible a conductivity, homogeneous solubility in aromatic solvents, such as toluene at between 20 and 105°C, and cathodic deposition of dense layers of aluminum-magnesium alloys with selectable proportions of the two components of from Al:Mg = 95:5 to 5:95 (col. 2, lines 38-49).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the method described by Dotzer by performing the

electrolytic coating is in the same electrolyte because *using electrolytes of type I and type II for the electrolytic coating* would have provided halide-free organoaluminum electrolytes which combine in themselves optimally the properties required for a technical application for the deposition of aluminum and aluminum-magnesium alloys, such as solubility of both aluminum and, in the case of alloy layers, magnesium anodes by electrolysis, as high as possible a conductivity, homogeneous solubility in aromatic solvents, such as toluene at between 20 and 105°C, and cathodic deposition of dense layers of aluminum-magnesium alloys with selectable proportions of the two components of from Al:Mg = 95:5 to 5:95 as taught by Lehmkuhl (col. 2, lines 38-49).

c. Wherein a mixture of the complexes $K[AlEt_4]$, $Na[AlEt_4]$ and $AlEt_3$ is employed as the electrolyte, as recited in claim 2.

d. Wherein a molar ratio of said complexes $K[AlEt_4]$, $Na[AlEt_4]$ to $AlEt_3$ is from 1:0.5 to 1:3, as recited in claim 3.

e. Wherein 0 to 25 mole% $Na[AlEt_4]$ is employed, relative to the mixture of the complexes $K[AlEt_4]$ and $Na[AlEt_4]$, as recited in claim 4.

f. Wherein a mixture of 0.8 mol $K[AlEt_4]$, 0.2 mol $Na[AlEt_4]$, 2.0 mol $AlEt_3$ in 3.3 mol toluene is used as the electrolyte bath, as recited in claim 5.

g. Wherein the molar ratio of said complexes $K[AlEt_4]$, $Na[AlEt_4]$ to $AlEt_3$ is 1:2, as recited in claim 13.

h. Wherein 5 to 20 mole% $Na[AlEt_4]$ is employed, relative to the mixture of

the complexes $K[AlEt_4]$ and $Na[AlEt_4]$, as recited in claim 14.

Lehmkuhl teaches organoaluminum electrolytes comprising:

A mixture of the complexes $K[AlEt_4]$, $Na[AlEt_4]$ and $AlEt_3$ is employed as the electrolyte (col. 3, lines 13-14).

A molar ratio of said complexes $K[AlEt_4]$, $Na[AlEt_4]$ to $AlEt_3$ is from 1:0.5 to 1:3 (col. 3, lines 13-14).

0 to 25 mole% $Na[AlEt_4]$ is employed, relative to the mixture of the complexes $K[AlEt_4]$ and $Na[AlEt_4]$ (col. 3, lines 2-5).

A mixture of 0.8 mol $K[AlEt_4]$, 0.2 mol $Na[AlEt_4]$, 2.0 mol $AlEt_3$ in 3.3 mol toluene is used as the electrolyte bath (col. 3, lines 2-5).

The molar ratio of said complexes $K[AlEt_4]$, $Na[AlEt_4]$ to $AlEt_3$ is 1:2 (col. 3, lines 1-2).

5 to 20 mole% $Na[AlEt_4]$ is employed, relative to the mixture of the complexes $K[AlEt_4]$ and $Na[AlEt_4]$ (col. 3, lines 2-5).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the electrolyte described by Dotzer with (c) to (h) above because from such mixtures, there would have been no crystallization even upon extended standing at room temperature, the specific conductivity at 95°C is 13.8 S/cm, and the addition of at least 0.3-0.5 mol of triethylaluminum would have been necessary to avoid deposition of alkali metal during the electrolysis as taught by Lehmkuhl (col. 3, 14-20).

Furthermore, it has been held that the selection of a known material based on its suitability for its intended use supports a prima facie obviousness determination (MPEP § 2144.06 and § 2144.07).

i. Wherein a mixture of $Na[Et_3Al\text{-}H\text{-}AlEt_3]$ and $Na[AlEt_3]$ and $AlEt_3$ is used as the electrolyte, as recited in claim 6.

j. Wherein a molar ratio of $Na[Et_3Al\text{-}H\text{-}AlEt_3]$ to $Na[AlEt_4]$ is from 4:1 to 1:1, as recited in claim 7.

k. Wherein a molar ratio of $Na[AlEt_4]$ to $AlEt_3$ is 1:2, as recited in claim 8.

l. Wherein a mixture of 1 mol $Na[Et_3Al\text{-}H\text{-}AlEt_3]$, 0.5 mol $Na[AlEt_4]$ and 1 mol $AlEt_3$ in 3 mol toluene is used as the electrolyte bath, as recited in claim 9.

m. Wherein the molar ratio of $Na[Et_3Al\text{-}H\text{-}AlEt_3]$ to $Na[AlEt_4]$ is 2:1, as recited in claim 15.

Lehmkuhl teaches organoaluminum electrolytes comprising:

A mixture of $Na[Et_3Al\text{-}H\text{-}AlEt_3]$ and $Na[AlEt_3]$ and $AlEt_3$ is used as the electrolyte (col. 3, lines 32-33).

A molar ratio of $Na[Et_3Al\text{-}H\text{-}AlEt_3]$ to $Na[AlEt_4]$ is from 4:1 to 1:1 (col. 3, lines 36-39).

A molar ratio of $Na[AlEt_4]$ to $AlEt_3$ is 1:2 (col. 4, lines 14-16).

A mixture of 1 mol $Na[Et_3Al\text{-}H\text{-}AlEt_3]$, 0.5 mol $Na[AlEt_4]$ and 1 mol $AlEt_3$ in 3 mol toluene is used as the electrolyte bath (col. 4, lines 16-18).

The molar ratio of said complexes $K[AlEt_4]$, $Na[AlEt_4]$ to $AlEt_3$ is 1:2 (col. 3, lines 1-2).

The molar ratio of $Na[Et_3Al\text{-}H\text{-}AlEt_3]$ to $Na[AlEt_4]$ is 2:1 (col. 3, lines 36-39).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the electrolyte described by Dotzer with (i) to (m) from above because from such mixtures, there would have been no crystallization from this electrolyte solution which would interfere with the technical applicability of the electrolyte, and the specific conductivity at 95°C is 8.12 mS/cm (col. 34, lines 18-22). During electrolysis, $Na[AlEt_4]$ would have dissolved aluminum anodes (col. 3, lines 52-55); and electrolytes of composition $Na[Et_3Al\text{-}H\text{-}AlEt_3]$, as solutions in toluene would have been very highly suitable for the electrolytic deposition and dissolution of aluminum at 90-105°C as taught by Lehmkuhl (col. 3, lines 56-60).

Furthermore, it has been held that the selection of a known material based on its suitability for its intended use supports a prima facie obviousness determination (MPEP § 2144.06 and § 2144.07)

n. Wherein the pretreatment is performed at an anodic load of the material with a current density of from 0.5 to 1.5 A/dm^2, as recited in claim 18

Dotzer teaches anodically pretreating for 15 minutes at a current density of *18 mA/cm^2* (col. 14, lines 3-10).

It would have been obvious to one having ordinary skill in the art at the time the

invention was made to have modified the pretreatment described by Dotzer with wherein the pretreatment is performed at an anodic load of the material with a current density of from 0.5 to 1.5 A/dm^2 because anodic load of the material is a result-effective variable and one skilled in the art has the skill to calculate anodic load of the material that would have determined the success of the desired reaction to occur, e.g., in order to loosen and remove the surface film and scale (MPEP §§ 2141.03 and 2144.05(II)(B)).

Furthermore, a *prima facie* case of obviousness exists where claimed ranges and prior art ranges do not overlap but are close enough that one skilled in the art would have expected them to have the same properties (MPEP § 2144.05(I)).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to EDNA WONG whose telephone number is (571) 272-1349. The examiner can normally be reached on Mon-Fri 7:30 am to 4:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam Nguyen can be reached on (571) 272-1342. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only.

For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Edna Wong/
Primary Examiner
Art Unit 1795

EW
April 9, 2008